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# DISCOVERIES AND IMPROVEMENTS IN ARTS, MANUFACTURES, AND AGRICULTURE.

## *Additional Observations on sawing Cast Iron.* By M. Dufaudier.*

(From the Annales des Arts, &c.)

M. DUFAUDIER has made several experiments on the method of sawing cast iron, according to the instructions of M. D'Arcet. Convinced of the facility with which hot cast-iron may be cut by means of a common saw, he has employed this method in his own works.

The following are the results of his different experiments:

1. That cast iron, when hot, can be sawed with as much facility and expedition as dry wood.
2. That in order to diminish the resistance, but very little play must be given to the saw.
3. That the iron, when heated in a kiln, saws better than that which is heated at a forge. The reason is simple. In a kiln it is equally heated in every part, whereas at a forge the part that is nearest the air tube is almost in fusion, while the opposite part is scarcely red.
4. That it is necessary to avoid making the iron too hot, for if the surface approach too near to a state of fusion, the saw softens, and the operation is ill performed.
5. That the saw should be moved with much velocity, because it does not warm so soon, it makes its way better, and the part cut is much more true and clean.
6. Lastly, that the cast iron should be placed on solid bearings, except under the immediate passage of the saw, otherwise there is danger that it may break before the end of the operation.

M. Molard, impressed with the utility of this method, repeated it immediately at the *Conservatoire des Arts et Metiers*, on pieces of cast iron of 0,07 metres square, and on plates of different thicknesses.

He employed a common saw, such as is used for wood, and perfectly succeeded in sawing different pieces without injuring the teeth of the saw. He observed that the iron should not be heated to a cherry red, that the saw should have but very little play, and that it must be moved quickly, and the whole length of the saw employed at each stroke or cut.

M. Pictet had seen a workman in the establishment of M. Paulino at Geneva, saw asunder a hot cast iron pipe. He mentioned it to M. Thenard, who communicated it to M. Molard. This gentleman, after making the experiments above-mentioned, found that the process was known to a workman of M. Voyeaux, who availed himself of it for fitting cast iron plates, intended for stoves of different sizes.

It is very probable that this method, so very simple, is also known in other places; but still it has been in a manner lost to the public, since it was unknown to the generality of persons who were distinguished in the arts.

We have seen that the experiments of M. Dufaudier confirm the relation of M. Pictet, and the trials made by M. Molard; there remains, therefore, no doubt of the possibility and also the utility of this process, the knowledge of which cannot be too much circulated.

## *Experiments on the Culture of Potatoes. By the Rev. James Willis, President of the Christ-Church Agricultural Society.*

As the culture of the potatoe is next in consequence to the culture of wheat, I have taken some pains, among other experiments, to ascertain the positive effect of different manures on the product of potatoes, in the same soil, with the same species, and under the same management. The result may not be uninstructive to the public; I will therefore beg leave to submit the table of the experiment to the notice of the Board. The sort planted was the white round, on the 10th of April, 1811, on a clean sandy loam, well pulverised, in rows two feet asunder, 12 inches distant in the row, and six inches deep. As this root is now daily considered more and more to shorten our consumption of bread corn, I was willing to see in what degree the eye alone would yield its product; and if it would produce as much as the whole root, a great quantity of food might be saved for the people. The result also of this experiment is for the consideration of the Board.

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* For the former account see the Belfast Monthly Magazine for January, 1813, Vol. 10, page 54.

*Table of Experiments with the White Round Potatoe.*

| | *Was planted with* | *Product.* |
|---|---|---|
| No. 1 | sheep's dung, | 1 bag and half per lug. |
| 2 | garden rubbish, | 1 bag and 3 gallons. |
| 3 | old rags, | 1 bag and half. |
| 4 | cow dung, | 1 bag and 3 gallons. |
| 5 | horse dung, | 1 bag and 3 pecks. |
| 6 | coal ashes, | 1 bag and half. |
| 7 | turf ashes, | 1 bag, 3 pecks, 1 gallon. |
| 8 | turf dust, | 1 bag, 3 gallons. |
| 9 | mown grass, | 1 bag, 2 bushels, 2 pecks, 1 gallon |
| 10 | hen's dung | 1 bag, 2 bushels. |
| 11 | pig's dung, | 2 bags, 3 pecks. |
| 12 | river mud, | 1 bag, 1 bushel. |

*Table of Experiment with Eyes only of the same Potatoe, planted on the* 12*th April,* 1810, *on the same Ground, with the same Manure.*

| | *Was planted with* | *Product.* |
|---|---|---|
| No. 1 | sheep's dung, | 1 bag, 1 peck, per lug. |
| 2 | garden rubbish, | 1 bag, 1 gallon. |
| 3 | old rags, | 1 bag, 2 gallons. |
| 4 | cow dung, | 1 bag. |
| 5 | horse dung, | 1 bag, 1 gallon. |
| 6 | coal ashes, | 1 bag, 1 peck. |
| 7 | turf ashes, | 1 bag, 1 gallon. |
| 8 | turf dust, | 1 bag. |
| 9 | mown grass, | 1 bag, 2 bushels. |
| 10 | hen's dung, | 1 bag 1 peck. |
| 11 | pig's dung, | 1 bag and half. |
| 12 | river mud, | 1 bag. |

On the careful examination of this table, we may easily perceive which is the most forcing manure. The pig's dung, old rags, and the coal ashes, have the superiority over the others; but the pig's dung outstrips all by almost double the quantity. The eyes produce a respective quantity with regard to the manures, but by no means equal to the whole root. I found them in digging much smaller also. This experiment will not only serve to prove what the most valuable manures are in the cultivation of this plant, but will convince us that the food saved in planting the eyes only, cannot be compared with the increase of produce in planting the whole root; besides, if we take into the account not only the loss in product, but the labour and manure, rent of land being equal in both experiments, no person will ever adopt the planting of the eyes, when he has seed enough to set either a half or a whole potatoe.

Potatoes and turnips I estimate as the two most invaluable roots that have been discovered among us; each seen in its proper light, and in which they seem more and more to be considered, has its separate and inestimable worth. The first is the poor and rich man's friend; supplying the place of wheat for the one, and ameliorating the soils of the other; the latter as a means of forming the sheep-fold on old as well as new lands, which is the grand preliminary step to the successful issue of every species of cropping, if a proper rotation is observed. These then are treasures indeed; the one affording, in all seasons, a solid succedaneum for the staff of life; the other, in all situations, an inexhaustible fund of manure. I have lately seen the surprising effects of turnips on some common fields that have been lately enclosed, and where never any grew before; the crops are doubled, the rent tripled, and the tenants thriving in the same proportion. It would be superfluous to say more on these two subjects; a thousand instances are known, beyond all doubt, to establish them in the opinion of every enlightened agriculturist, as the foundation of all good husbandry.

### *Observations on Spring Wheat, Thatch and Vermin. By the same.*

The introduction of spring wheat in this district is another great improvement, tending to increase our resources and *decrease* our import. I have used it to fill up the vacancies of my winter's wheat with great effect; and others have planted it after turnips the first week in May, instead of *barley*, and it has generally, taking the grain and straw together, turned out a more productive crop. We conceive, from experience, that spring wheat is less subject to the diseases that usually affect the autumn wheat; although in districts in the neighbourhood of the sea, as is the case with us, it is observable, that all crops of grain are usually exempt from those disorders that materially injure the grain of inland counties. The Southwest wind, in July or August, in some exposed situations, is more fatal to the farmer than smut or mildew.

There are matters of minor consideration, that stand in the way of our national improvements in husbandry, and eventually are the means of increasing our import. These claim our attention in some degree, though not equally, perhaps, to those points that have already been discussed. *Thatch*, that is applied to the covering of our buildings, may not strike the superficial observer as the cause of an increase of importation of grain, and a check to the progress of agriculture. To prove this position, I shall only mention the millions of tons of straw, which are now lost as a manure, and which ought to be used as provender for rearing a greater stock of cattle, bringing more land into corn, and in furnishing the markets with thousands of cattle more than at present. This practice alone, however trifling it may appear to many, is depriving this country annually of an immense quantity of meat and corn. Slate is *now* prevailing as a substitute: and when we calculate on the danger of fire, double insurance, the public and private loss, and every other expense incidental to thatching, slating on all our buildings cannot be too much encouraged.

Vermin of all kinds, on the aggregate of the kingdom, is another serious consumption of our annual produce. Take only the loss, on the average, at two quarters of grain *per* parish, multiply this by ten thousand, which is about the number of parishes in England, and then imagine how many thousands of the people might be maintained by the saving of this grain, so destroyed! It is an object of our industry to procure good crops; and this object should lead us on farther to dispose of them wisely, in the aid of future husbandry, with regard to the increase of manures, and to protect the grain, when we have raised it, from *all* depredations.

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